

REMARKS

This Amendment and Response is responsive to the Office Action mailed February 15, 2002. In that Action: Claims 1-22 were pending; each of which were rejected under 35 USC §102(e) as being anticipated by Liu et al. (USPN 6,141,076). Reconsideration of the rejections of Claims 1-22 and initial examination of new Claims 23-26 are hereby requested.

Claims 1-22 have been rejected as anticipated by Liu et al., which appears to disclose a spatial light modulator (SLM) using non-surface-stabilized ferroelectric liquid crystals (FLCs) having a cone angle (referred to in Liu as the tilt angle) between 20 and 25 degrees. The FLC material is placed between a pair of parallel transparent electrodes, each having an alignment layer on an inner side thereof. The alignment layers are preferably rubbed with a light buffing force (resulting in weak anchoring energy of the adjacent FLC molecules), in a non-parallel fashion such that the alignment directions of the two alignment layers differ by an amount in the range of 45 to 90 degrees. Although strong buffing is described to have certain disadvantages, it is described in one embodiment in which the alignment directions differ by 45 degrees. Light buffing is described to create a high pre-tilt angle of an unspecified amount (col. 4, lines 23-26), while the strong anchoring case (col. 4, lines 31-36) is taught to produce liquid crystal molecules that are laid in parallel to the buffing direction (i.e., a zero pre-tilt angle). There appears to be no written disclosure of the quantitative amount of pre-tilt other than claim recitations in claims 1, 12, and 15.

Independent Claims 1, 13, and 14, on the other hand, relate to an optical device with a ferroelectric liquid crystal material, the device including a first and second substrate, with alignment treatments applied to surfaces of the first and second substrate. The alignment treatment on each of the two substrates induces an orientation of at least a portion of the

ferroelectric liquid crystal material therebetween along an alignment direction. The first and second substrates are located relative to each other in such a manner that the first and second alignment directions are not aligned with each other, so that a non-zero angle Ω is formed between the projections of the two alignment directions on the two substrates. Further, the claimed invention requires that the device is free of chevron structures. In contrast, Liu only once refers to chevrons in the discussion of his disclosed emodiments, when he discusses a structure that does produce chevrons (col. 4, lines 35-37). Thus, Liu does not disclose a chevron-free structure or discuss how one would make such a structure. Liu does not even appear motivated to create a chevron-free structure. As can be seen, the claimed invention differs from Liu in this key aspect, and thus is not anticipated thereby. For all the above reasons, it is respectfully submitted that Claims 1, 13, and 14 are patentable over Liu, and that each of the dependent claims (Claims 2-12 and 15-22) are patentable as well.

New Claim 23 is believed to be patentable because of its dependence on Claim 9 (and ultimately on Claim 1) and because of the additional limitation that the first and second pretilt angles are non-zero. New Claim 24 is believed to be patentable because of its dependence on Claim 21 (and ultimately on Claim 13) and because of the additional limitation that the first and second pretilt angles are non-zero. New Claim 25 is believed to be patentable because it has many of the same limitations of Claim 1 and it requires that the ferroelectric liquid crystal material in the optical device be surface stabilized. New Claim 26 is believed to be patentable because it has many of the same limitations of Claim 1 and it requires that the first and second substrates be spaced apart by a distance sufficiently small to suppress formation of helices typically formed in bulk of the ferroelectric liquid crystal material. Liu's disclosure is directed to

non-surface-stabilized structures, by his own admission (col. 2, lines 23-25, col. 8, line 24, and col. 9, line 25).

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.



Respectfully submitted,

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